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St. Petersburg Times

A LOOK AT AN EXTRANET Series: COVER STORY:[SOUTH PINELLAS Edition]

JEFF HARRINGTON. St. Petersburg Times. St. Petersburg: Mar 29, 1999. pg. 9>> [Jump to full text](#) Author(s): JEFF HARRINGTONSection: BUSINESSPublication title: St. Petersburg Times. St. Petersburg: Mar 29, 1999. pg. 9Source Type: Newspaper

ProQuest document ID: 40166659

Text Word Count 502

Article URL: http://gateway.proquest.com/openurl?url_ver=Z39.88-2004&res_dat=xri:pqd&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&genre=article&rft_dat=xri:pqd:did=0000000040166659**Abstract** (Article Summary)

Here is a glimpse of how a typical iTech Data customer, say "Joe's Computer Store," might use the company's **extranet** to shop, place orders and even create its own World Wide Web site.

1. Joe signs on to iTech Data's Web site (<http://www.techdata.com>) and enters a password to access the **extranet**. Among his smorgasbord of options: checking out services and specials offered by iTech Data, signing up for an expo and arranging a line of credit.

2. Joe browses through iTech Data's inventory: 600 pages of electronic information with prices and specifications for more than 75,000 parts. Joe cannot tell that prices have been automatically set for what iTech Data wants to charge him. Likewise, he sees only the promotions and discounts that iTech Data wants to offer him.

Full Text (502 words)*Copyright Times Publishing Co. Mar 29, 1999*

iTech Data Corp. employees say their motto is "invisible but indispensable."

The saying certainly holds true for the **extranet** the Clearwater company has set up for its customers: the thousands of computer resellers across the country that order equipment from iTech Data.

Here is a glimpse of how a typical iTech Data customer, say "Joe's Computer Store," might use the company's **extranet** to shop, place orders and even create its own World Wide Web site.

1. Joe signs on to [iTech Data's](http://www.techdata.com) Web site (<http://www.techdata.com>) and enters a password to access the extranet. Among his smorgasbord of options: checking out services and specials offered by [iTech Data](http://www.techdata.com), signing up for an expo and arranging a line of credit.

2. Joe browses through [iTech Data's](http://www.techdata.com) inventory: 600 pages of electronic information with prices and specifications for more than 75,000 parts. Joe cannot tell that prices have been automatically set for what [iTech Data](http://www.techdata.com) wants to charge him. Likewise, he sees only the promotions and discounts that [iTech Data](http://www.techdata.com) wants to offer him.

Curious about the availability of a certain modem, Joe finds out, with a click, that [iTech Data](http://www.techdata.com) has 99 of them available at a warehouse in Suwanee, Ga. Twenty more are about to arrive.

3. Joe decides to build his own, customized computer system to sell to his customers, mixing parts from different manufacturers. He would like to get a processor from Compaq but the [iTech Data](http://www.techdata.com) site warns him it isn't compatible with the modem he wants. So he lets the computer pick which processor to use and fill in some of the other blanks for him.

4. Joe fills out an online order form, choosing when he wants the product shipped and from what warehouse. The computer tells Joe whether he has to use UPS ground delivery or qualifies for air delivery.

Joe can have the product shipped to his store or directly to the customer buying the computer. If he wants "private label delivery," [iTech Data](http://www.techdata.com) will paste a "Joe's Computer Store" mailing label on the package and ship it to Joe's customer. The customer never knows [iTech Data](http://www.techdata.com) even exists, assuming the computer was shipped by Joe's.

5. A day later, Joe signs back on to check the status of his order.

He decides to use [iTech Data](http://www.techdata.com) to create his own Web site for retail customers. Joe provides select customers with an ID and password. When they sign on, the customers are looking at information from [iTech Data's](http://www.techdata.com) data base, but the site is tailored with the "Joe's Computer Store" logo. He can limit which equipment he wants to put on the site. The prices automatically reflect whatever markup Joe has decided to charge. Like [iTech Data](http://www.techdata.com), Joe can offer different prices and different promotions to each customer if he chooses.

- JEFF HARRINGTON, Times staff writer

[Illustration]

Caption: [iTech Data's](http://www.techdata.com) web site; [iTech Data's](http://www.techdata.com) inventory page on its web site; [iTech Data's](http://www.techdata.com) order inquiry web page; [iTech Data's](http://www.techdata.com) order form web page; Photo: COLOR PHOTO, (4)

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CQ-FACTS

V! Tech Data

www.techdata.com

welcome

Tech Data Corporation, (NASDAQ: TECD) is a leading distributor of more than 75,000 computer products and business services to over 100,000 resellers.

To enter the U.S. site, select a link to the right.



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 **TD Brasil**

 **Tech Data France**

 **Germany**

[Computer 2000](#)

Our Customer site requires an ID and password to enter. [Click here](#) if you are a current Tech Data customer and you do **not** have an Electronic Commerce ID and password.

To get the most out of our site, please use one of the following browsers and the Adobe Acrobat reader:

[Microsoft's Internet Explorer 4.0 or higher](#)

[Netscape Navigator 4.08 or higher](#)

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welcome to TDweb Canada

solutions for Tech Data's value-added resellers

May Highlights

-Tech Data **Mails Offer To Globelle Shareholders**

-**ATTN: Changes for TDonline users**

-Secure areas of our site are available on Sundays from 12:00 p.m. to 8:00 p.m. (EST)

Last site update: May 5, 1999.

Note: The information contained in our Electronic Catalogue and Web Order Entry tools are updated daily.



Web Order Banner

Popular Quick Links

► **Electronic Commerce (EC)**

- ☐ [EC User Agreement](#). (Access secure areas of our site. Resellers only.)
- ☐ [EC Admin](#). (Allows Master Users to set account password privileges)
- ☐ [Download TDonline Software](#) (On-line order-entry and order-inquiry capabilities)
- ☐ [Web Order Entry](#) (ETA now available)
- ☐ [Step-by-Step Web Order Instructions](#)
- ☐ [Electronic Catalogue:](#)
 - ☐ [Full Product Search](#)
 - ☐ [Quick Product Search](#)
 - ☐ [Price File Download](#)
 - ☐ [Order Inquiry](#)

► **May Product Promotions**

- ☐ [Bad Box Specials](#) (Last update: April 28)
- ☐ [Visio Cyberspot](#)
- ☐ [NEC Versa Promotion](#)

► **Visit our Manufacturers**

- ☐ [Web site Links](#)

Tech Data Information & Services

► **Business Services**

[Credit; Configuration and Assembly; Customer Service](#) (Return Authorization Form found here); [Electronic Commerce Solutions; Marketing Services; Private Label Delivery; Reseller Events; TD WebSource](#) (library of product, services and promotion documents); [Technical Support](#)

► **Products**

- ☐ [Software](#) (Includes licensing information)
- ☐ [Workflow, Imaging, and Document Management](#)
- ☐ [Terms & Conditions of Sale](#)
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For Canadian resellers only.

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SpaceWorks OrderManager 4.0 Release Strengthens Order Management Automation Up and Down Supply Chains

PR Newswire. New York: Sep 23, 1998. pg. 1

>> [Jump to full text](#)

Dateline: California

Publication title: PR Newswire. New York: Sep 23, 1998. pg. 1

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Article URL: http://gateway.proquest.com/openurl?url_ver=Z39.88-2004&res_dat=xri:pqd&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&genre=article&rft_dat=xri:pqd:did=0000000034498373

Abstract (Article Summary)

LOS ANGELES, INTERNET COMMERCE EXPO, Sept. 23 /PRNewswire/ -- Booth #55/Internet Open -- The breakthrough Version 4.0 of **SpaceWorks(R)** award- winning OrderManager(R) software for **Extranet Commerce (EC)** announced today, features enhancements that revolutionize a company's ability to automate transactions up and down their supply chains. With these added capabilities, the Company has leveraged its five years' experience in automating front- office sales to outside buyers to now further streamlining MRO procurement activities among an enterprise's inside buyers.

This new version release from **SpaceWorks** -- scheduled for availability in Q4 -- advances the EC pioneer's vision to offer Corporate America a fully integrated application solution to facilitate either Web-based buy- or sell- side transactions. In fulfilling this vision, Version 4.0 innovates OrderManager's functionality through a modular approach that allows corporations to incrementally phase in functions over time to accommodate evolving intranet/extranet commerce needs and requirements.

In this new modular design, an enterprise which launches an OrderManager "selling" solution on the Web can at a later date pay a license fee to un-lock the "buy-side" features without having to purchase and set up a separate system. The same holds for organizations that wish to start with Web-based MRO procurement, then later "unlock" capabilities to launch a Web selling channel.

Full Text (809 words)

Copyright PR Newswire - NY Sep 23, 1998

Industry: COMPUTER/ELECTRONICS; INTERNET MULTIMEDIA ONLINE

Support for Complex Order Functions Raises Stakes in EC Marketplace

LOS ANGELES, INTERNET COMMERCE EXPO, Sept. 23 /PRNewswire/ -- Booth #55/Internet Open -- The breakthrough Version 4.0 of **SpaceWorks(R)** award- winning OrderManager(R) software for **Extranet Commerce (EC)** announced today, features enhancements that revolutionize a company's ability to automate transactions up

and down their supply chains. With these added capabilities, the Company has leveraged its five years' experience in automating front-office sales to outside buyers to now further streamlining MRO procurement activities among an enterprise's inside buyers.

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"Our vision to offer integrated 'add on' modules to our flagship order management product stems from the market reality that a large overlap in features exists between 'buy-side' and 'sell-side' solutions," said Dave MacSwain, President and CEO. "With this modular approach to Internet commerce, we've revolutionized our customers' ability to set an evolution strategy for long-term supply chain automation."

Support for complex order building, submission and tracking over the Web takes the order management capabilities of this new version to the next plateau for an enterprise. Central to this new functionality is the optional module to accommodate multiple vendors' product catalogs-

-an enhancement over the previous version which handled a single vendor's wares. Buyers now can research desired selections across an unlimited number of authorized vendors and build consolidated order forms containing goods or services from disparate sources.

By the same token, upon electronic submission of the order, individual line items are automatically directed to appropriate suppliers for processing -- either through direct gateways or by leveraging existing EDI investments. Finally, buyers can track complex orders and see immediate status of component parts in the fulfillment stages across differing suppliers.

Another new, optional feature represents a significant advancement to the One-Step Approval process supported in OrderManager 3.0. OrderManager 4.0 now permits orders to be routed for approval to an unlimited number of individuals depending on pre-established criteria. This feature can be integrated with internal human resource systems to ensure a consistent view of the organizational hierarchy. Users who originate orders can choose to have the order routed back to them after final approval or submitted directly; they also can elect to receive an email alert after each completed stage in the order request's route.

OrderManager 4.0 also offers an optional enhanced product configurator that helps users to pick the right products to build a complementary grouping of inter-connected items. And, the new version supplies a second, standard "out-of-the-box" user interface template -- giving enterprises two very different options for branding the look and feel of their application, while still offering the option for a full customization.

Additionally, OrderManager 4.0 for the first time uses Java on the server side of the application to further optimize customization, upgradability and internationalization of the solution. Java's sophisticated object-oriented programming capabilities ensure further robustness in the implementation of customer specific business rules. (More details about **SpaceWorks** use of Java were announced today, in a separate press release from the Company.)

"Today's announcement of support for complex orders raises the stakes in the extranet commerce arena," said Liz Sara, **SpaceWorks** Co-founder and Vice President of Marketing. "With this newest version of OrderManager, we have proven **SpaceWorks** commitment to pioneer break-through, comprehensive functionality for Web-based order management transactions of any variety. OrderManager is the first -- and only -- Internet solution to provide corporations with a modular, flexible means to automate business transactions up or down their supply chain."

Headquartered in Maryland's "Technology Corridor," **SpaceWorks** develops, markets and supports a suite of business-oriented electronic commerce software applications for use on the Internet, through private corporate intranets and over extranets. The OrderManager software enables corporations to reinvent the way they operate with their supply chain partners, suppliers, and business clients in the information economy. More information is available on the Company's Web site, <http://www.spaceworks.com>.

NOTE: OrderManager and **SpaceWorks** are registered trademarks of **SpaceWorks, Inc.** All other trademarks and registered trademarks are the properties of their respective holders.

Screen shots of OrderManager 4.0 are available in various graphical formats, by request. SOURCE **SpaceWorks, Inc.**

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ORDERMANAGER

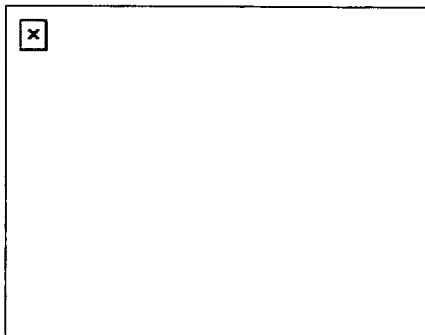
DEMO

ARCHITECTURE

CASE STUDIES

☒ OMheader_main.GIF (4498 bytes)

- ▶ Improve Your Bottom Line and Spend More Time Being Productive
- ▶ Deploy A Complete Solution that is Easily Tailored
- ▶ Read More About OrderManager

Full-Scale Electronic Commerce Begins Here

SpaceWorks OrderManager Internet commerce software automates both sales and procurement transactions up and down the supply chain. Which means the same Web commerce system that allows customers to buy from your company 24 hours a

day also can simplify your company's own purchasing of maintenance, repair and operations (MRO) products.

SpaceWorks OrderManager is a complete solution which enables your company to reduce order-processing costs, slash procurement-related expenses, become more competitive, increase customer and user satisfaction and enhance supplier relationships.

As a Web-based sales channel, OrderManager software provides a company's trading partners real-time access to information in the company's back-end systems over the organization's corporate extranet or the Internet. With OrderManager, your trading partner customers use a Web browser to answer their own questions about product and service prices, real-time availability, previous orders and account status.

As a Web-enabled procurement system, OrderManager makes it easy for employees to comparison-shop for MRO supplies from your company's authorized vendors and consolidate orders from multiple sources. Employees can automatically

route orders for approval or submit them to each preferred vendor over the Internet, via electronic data interchange (EDI), through email or via fax.

Automate Order Processing Over the Web

The OrderManager application is applicable to any industry segment, from computer products to telecommunications services, to electrical parts, to automotive supplies and can be implemented as is or further tailored to meet any customer's specific business needs.

The latest version of OrderManager – OrderManager 4.0 – includes comprehensive standard features such as:

- A fully searchable catalog with robust, multiparametric searching engine.
- Secure, real-time product inventory availability.
- Immediate account-specific pricing.
- Real-time product allocation or service provisioning.
- Cross-marketing of related products or services.
- Multiple shipping/delivery options, including drop shipments.
- Real-time status of orders previously placed.
- Up-to-date summary of customer sales and accounts payable information.
- Management reports on volume and dollar value of electronic orders.
- Guest access to view catalog information.
- Multi-vendor catalog to compare product offerings across suppliers.
- Multi-level approval process based on business rules by users or accounts.
- Complex ordering from multiple vendors on a single order form.
- Quick order entry allows the buyer to order items on the fly.
- Saved Order allows the user to reuse the template at a later date.
- Master & subaccounts to apply purchases to specific cost centers.
- Customizable User Interface to meet your own look-and-feel requirements.
- Configurator feature simplifies ordering of complex components.
- Real-time shipping status linked to carrier of your choice.

Improve Your Bottom Line And Spend More Time Being Productive

A company that implements OrderManager can reduce the cost of all order-related transactions - whether generated by their external trading partners or their internal procurement agents - by up to 75 percent over their traditional ways of doing business.

According to current industry research, it costs more than \$100 to manually process the typical purchase requisition. Automated, Web-based procurement reduces that cost to less than \$30 and saves a full work week of processing time - doing in two days what now takes more than seven.

Automated procurement also can help eliminate waste, control user access and improve leverage with suppliers... further saving as much as 20 percent on outside purchases.

Companies can redeploy costly service desk operators to more lucrative business development activities. OrderManager allows a large enterprise to reduce the staff time spent on administrative tasks and increase the time devoted to more profitable and productive new business activities. The result is immediate and measurable reductions in cost and improvements in efficiency:

- Staff spends less time answering recurring questions about product or service price and availability.
- Order-taking accuracy increases with the elimination of error-prone redundant information handling.
- Fewer returns due to incorrect orders.

Deploy A Complete Solution that is Easily Tailored

Unlike Internet-based development tools you might use to build your own electronic ordering capabilities, OrderManager provides a complete, turnkey solution.

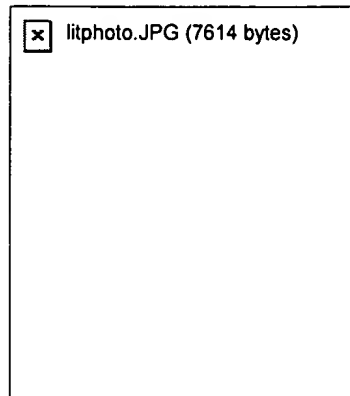
The application consists of comprehensive, standard features which can be implemented as is, or easily enhanced to fit a specific business model or vertical industry, respond to evolving order management processes, and stay ahead of the competition.

Based on Internet technologies such as HTML, Java, and Java Script; OrderManager enables a fully-deployed, fully-automated electronic commerce channel in as little as 60 days. This contrasts with the typical one year of development time usually associated with crafting a custom e-commerce solution using multiple tools, vendors and consultants.

The SpaceWorks Professional Services division provides a

full suite of OrderManager implementation services, such as requirements analysis, detailed design, programming, testing and training. This team is already experienced in handling the integration of OrderManager with numerous back-end systems. Additionally, this team can deliver custom or tailored features to meet unique client requirements.

Read More About OrderManager



The OrderManager Product Brochure is available online using Adobe's Acrobat Reader. If you have Acrobat Reader, simply select one of the files listed above. If you do not have Acrobat Reader, you can obtain a free copy from the Adobe Web site or by clicking the Adobe icon below.



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Order Status

BILLED
 SHIPPED
 VOICED

Part number 5673

order status: 2b

Generate PO##

Order Summary

Part number

order status: 12

Gold Accounts Silver Accounts Bronze Accounts

Part number 776

order status: 52

Date:

Account Number:

Part number 559

order status: 238

Part number 289

order status: 69

//

Part number 778

order status: 8

////////

Serial number

UC632757

UC632757

UC632757

UC555780

UC343292

UC6323999

SUBMIT ORDER

Invoice

Payme

Part #	Mfr Part #	Price
512 6150	M4140LL/A	\$1,878.91
586 6150	M4067LL/A	\$2,184.05
523 IICI	M5718LL/A	\$902.00
519 5215CD	M4100LL/A	\$1,470.31
708 6220CD	M4104LL/A	\$1,436.88
582 6290CD	M4727LL/A	\$1,796.35
508 6300CD	M4425LL/A	\$2,245.71
582 6320/120	M4957LL/A	\$2,155.83
05 6400/200	M516711/a	\$2,515.31

12 Hits

GRND TRAC

3 DAY

BLUE

EARLY AM

GRNDTRAC

INT'L

NEXT DAY

NEXT D/S

Inventory

Atlanta 29

Chicago 8

Dallas 57

Seattle 5

BILLING

SPACEWORKS® ORDERMANAGER™

Turn your order processing, management,
 and fulfillment operations into your global
 advantage...over the Internet.

SPACEWORKS

INTRODUCING SPACEWORKS ORDERMANAGER

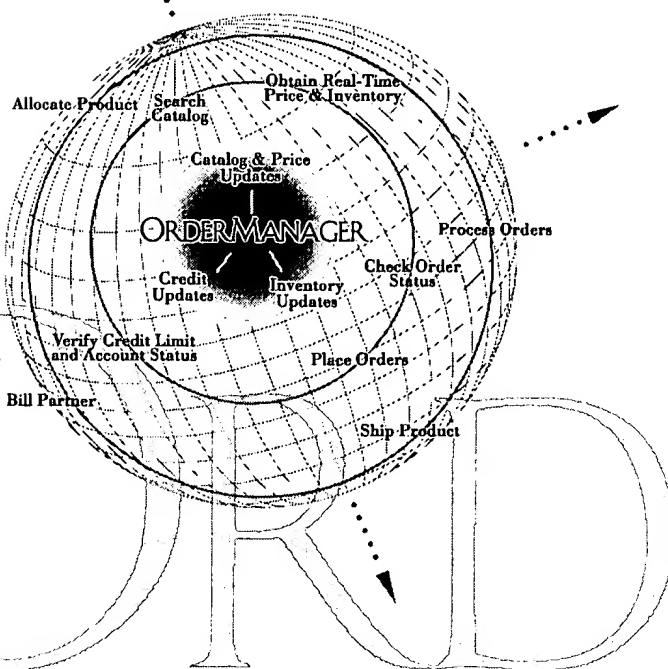
A NEW WAY OF DOING BUSINESS IS IN ORDER

Reduce Order Processing Costs As Much As 75 Percent.

The SpaceWorks® OrderManager™ software application transforms traditional order processing into a complete electronic channel...one that directly links your supply chain partners, resellers and customers to information in your back-office systems over the Internet or your corporate intranet.

Your trading partners can use standard Web browsers to help themselves to real-time answers on prices, product availability, previous orders, and account status. They place orders on-line without assistance, paperwork, or delays. You instantly allocate inventory, automatically fill orders, and ship product direct to buyers without labor-intensive procedures or time-consuming phone calls.

That's how some of the nation's largest wholesalers and distributors are already using SpaceWorks OrderManager application to reduce order processing costs by up to 75 percent.



How Today's Most Effective Businesses Really Use the Internet... and SpaceWorks OrderManager.

Unlike Internet-based development tools you might use to build your own electronic ordering applications, SpaceWorks OrderManager is a complete, turnkey solution available *today*. We have successfully implemented OrderManager links to several back-office enterprise systems from IBM mainframes and AS/400's to SAP R/3. All of which means you could be conducting full-scale electronic commerce in less time and for less cost than you expect.

You can implement the OrderManager application right from your Web site for use with *any* trading partner or limit access to a defined group of customers or employees. Either way, OrderManager lets you maintain full control and security.

Helping Buyers to Help Themselves.

The OrderManager software application provides your trading partners with a self-service ordering system, 24 hours a day. Comprehensive features include:

- Fully searchable, multi-media catalog.
- Secure, real-time product inventory availability.
- Immediate reseller-specific pricing.
- Real-time product allocation.
- Cross-marketing of related products.
- Multiple shipping/delivery options, including drop shipments.
- Real-time status of orders previously placed.
- Up-to-date summary of customer sales and accounts payable information.
- Management reports on volume and dollar value of electronic orders.

Order Summary 7 of 8

Gold Accounts Silver Accounts Bronze Accounts

Payment \$

Date: Account Number:

Location: Generate PO#

order status:
 //
 Part number:
 order status:
 //
 Serial numbers:
 UC6327599-883
 UC52127468-881
 UC67668999-888
 UC55578000-999
 UC3432920
 UC67223999-810

Since the OrderManager application consists of a library of HTML and Java-based graphical user interface pages, you can implement the product *as is*, or easily enhance the standard product features by adding new capabilities...to fit your specific business model, respond to evolving order management processes, and stay ahead of the competition.

And because electronic commerce is all about flexibility, you have the option to operate and maintain the SpaceWorks OrderManager application at your site, outsource it to us or outsource it to an information service provider for a fully-managed solution.

The SpaceWorks service bureau provides a host server center, telecommunications infrastructure and a toll-free customer hotline...all designed to get you up and running in a quick turn-around time.

Improve Your Bottom Line.

Lower the cost of processing orders by eliminating labor-intensive, costly paperwork, and processing delays.

Increase sales revenues by making it easier for resellers and customers to buy and giving them easy access, 24 hours a day, everyday, to information on products, pricing, and availability.

Improve order-taking accuracy, speed up fulfillment, and reduce returns by eliminating error-prone redundant information handling.

Extend the life and reach of back-office systems using SpaceWorks OrderManager to integrate numerous legacy data repositories which are too costly to replace.

And Spend More Time Being Productive.

Reduce costly tele-sales functions by transforming the order process into a Web-based, customer self-service ordering system.

Make better use of staff, because reducing the time people spend answering recurring questions about price and availability increases their time for more profitable, value-added business development activities.

"Buying and selling are undergoing a major upheaval as enterprises begin using electronic marketplaces to display, sell, and buy goods and services."

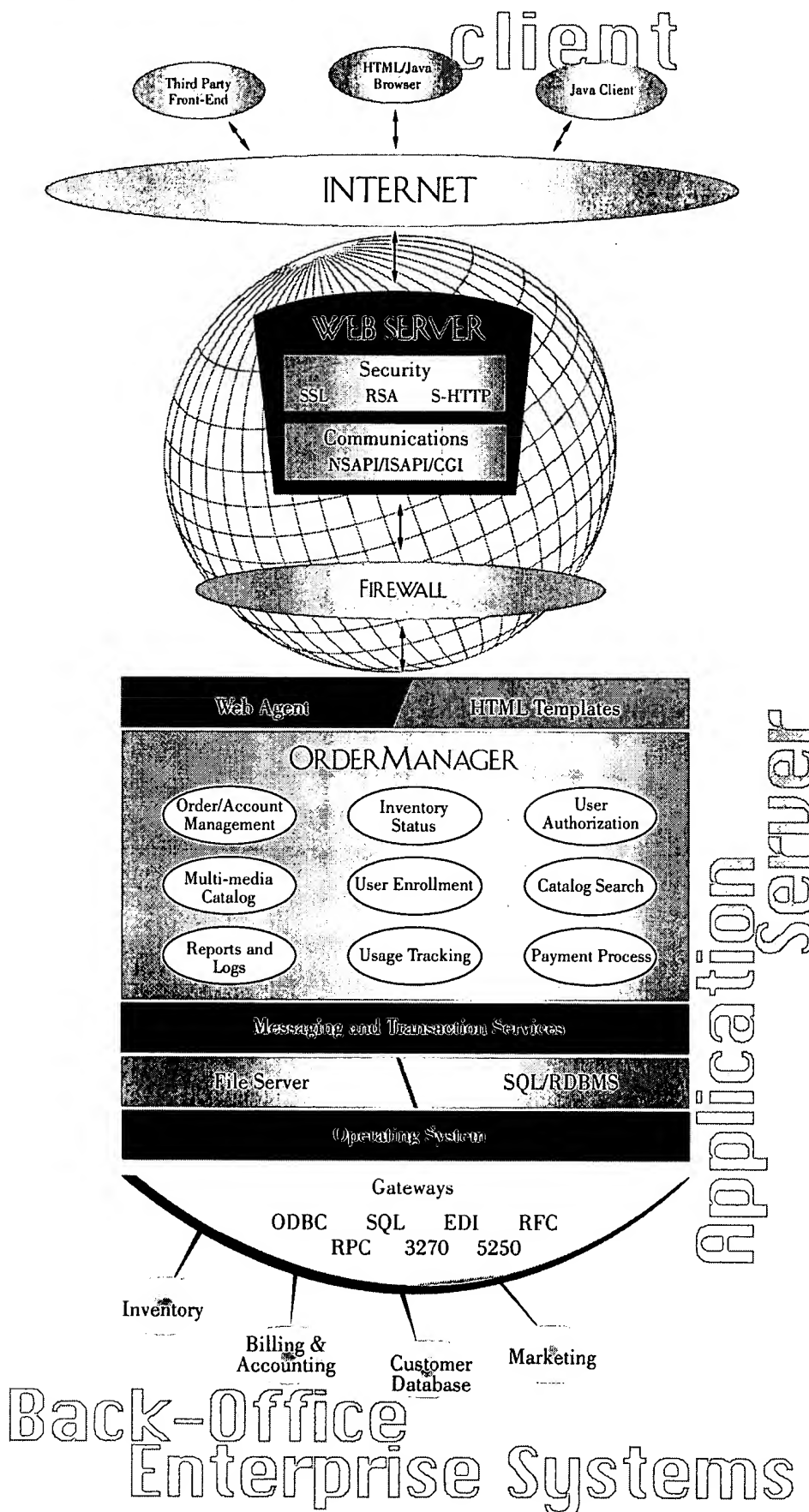
— Gartner Group

Inventory

MANAGER

ORDERMANAGER TOPOLOGY

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Full-Scale Electronic Commerce Begins Here.

SpaceWorks enabling technology is built on an object-oriented, open systems design which delivers core functionality while accommodating easy customization of existing product features and the addition of new ones. The diagram illustrates how the OrderManager application extends the reach of back-office enterprise systems to trading partners. Designed expressly for Internet commerce, OrderManager provides secure transactions through RSA encryption, SSL, and authentication. OrderManager utilizes standard APIs for extending the functionality and interoperability of Web servers with add-on applications while improving performance. The OrderManager application takes full advantage of industry-standard enabling technologies to achieve production-ready scalability, performance, and reliability.

Immediate Delivery From The Leader In Electronic Commerce.

Since 1993, we've based our entire business on creating enterprise-wide, customizable electronic commerce applications for businesses like yours. Our complete software solutions are available today and already at work delivering cost savings, performance efficiencies, and productivity improvements for Fortune 500 companies.

The Sooner You Call, The Sooner You Can Conduct Business Electronically.

For more information on how the OrderManager application can transform your conventional order processing operation into full-scale electronic commerce, visit our Web site at www.spaceworks.com or call us today at 1-800-5-SPACE-5.

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BELLEVUE, Wash.--(BUSINESS WIRE)--May 5, 1999--Onyx(R) [Onyx Software Corporation](#) (Nasdaq:ONXS) today announced general availability of Onyx Customer Center version 4.5, the company's flagship product in the Onyx Front Office suite.

New features in Customer Center 4.5 focus primarily on sales, in the areas of forecasting, quoting and task management. Additional sales enhancements announced today include Onyx eSelling, Onyx Connect and Onyx Pricing Manager, all of which add significant depth to [Onyx Software's](#) overall sales automation solution.

Also today, [Onyx Software](#) announced Onyx eSelling, the name for its suite of Web-based products for sales that includes Onyx Web Wizards for Sales, Onyx Channel Connect and Onyx EnCyc. Onyx eSelling allows users to extend and automate lead capture, streamline response to prospects, interact directly with customer records via the Web, publish marketing materials directly to the Web, and more.

Full Text (1066 words)*Copyright Business Wire May 5, 1999*

BELLEVUE, Wash.--(BUSINESS WIRE)--May 5, 1999--Onyx(R) [Onyx Software Corporation](#) (Nasdaq:ONXS) today announced general availability of Onyx Customer Center version 4.5, the company's flagship product in the Onyx Front Office suite.

New features in Customer Center 4.5 focus primarily on sales, in the areas of forecasting, quoting and task management. Additional sales enhancements announced today include Onyx eSelling, Onyx Connect and Onyx Pricing Manager, all of which add significant depth to [Onyx Software's](#) overall sales automation solution.

"Today we're delivering components of Onyx Front Office that are particularly relevant to the sales user. Whether its generating quotes at the point of sale or instant follow up on Web leads, Onyx provides sales users with an easy-to-use relationship management system that helps them focus on closing deals," said [Onyx Software](#) President & CEO Brent Frei.

Onyx Customer Center 4.5 became generally available last quarter. It includes enhanced quoting capabilities that allow salespeople to generate an unlimited number of quote versions, flexible forecasting that allows for more predictable, accurate forecasts, and improved workflow in the area of task management.

"Onyx places a great emphasis on quality," said Will McCuen, director of corporate systems at [Datastream](#), who recently performed a beta test of Onyx Customer Center 4.5. McCuen added that [Datastream](#) chose [Onyx Software](#) over other enterprise relationship management companies because of the ease of use, functionality, look and feel of the interface, and reliability of its products. "It's a real solution that actually works, not just a group of features in a brochure," he said.

Onyx eSelling Unveiled

Also today, [Onyx Software](#) announced Onyx eSelling, the name for its suite of Web-based products for sales that includes Onyx Web Wizards for Sales, Onyx Channel Connect and Onyx EnCyc. Onyx eSelling allows users to extend and automate lead capture, streamline response to prospects, interact directly with customer records via the Web, publish marketing materials directly to the Web, and more.

"We can quickly process Web leads using Onyx Web Wizards for Sales," said Heman Smith, director of electronic services, Vinca Corporation. "Leads don't drop into a black hole. And we can effectively track progress and effort by channel partners on leads given out or assigned with Onyx Channel Connect. We are able to more clearly see what is happening in our sales and support processes because of the interrelated nature of the Onyx solution. Reports show where we are becoming more effective in our processes and where we need more work."

Onyx eSelling Highlights Use of the Web

Each product in the Onyx eSelling suite is Web based and designed to facilitate sales activities and improve customer response time. Onyx Web Wizards for Sales provides Internet-based lead generation and qualification and automated literature fulfillment, improving the effectiveness of a company's Web site. Information collected from customers is entered directly into the Onyx Customer Center database, including product ID, priority, description, and detailed worknotes. Web Wizards for Sales can be used any hour of the day, seven days a week, and gives customers real-time access to sales leads.

Onyx Channel Connect allows companies to quickly distribute sales and lead information to channel partners via an extranet. Channel partners can use Onyx Channel Connect to access the Onyx Customer Center database via the Internet to immediately view information on new and existing sales opportunities. Users can download critical customer information, update status on existing sales and review information on closed sales opportunities.

Onyx EnCyc is a complete and easy-to-use marketing encyclopedia which allows users to generate consistent, custom communications. Onyx EnCyc's intuitive interface allows users to quickly access marketing and sales information including product literature, presentations, competitive information and sales assistance. Information can also be shared via the Internet, Intranet or extranet.

[Onyx Software](#): Pioneer of Web-based Solutions

The announcement of eSelling comes on the heels of eService, a Web-based service and support product suite announced by Onyx last quarter. eService -- which includes Onyx Insight, Onyx Web Wizards for Service and Onyx Email Agent -- provides customers the cost- savings, flexibility and convenience of Web-based customer service. Both the Onyx eSelling and Onyx eService product suites work in conjunction with Onyx Customer Center and make up Onyx Front Office.

Onyx was one of the early pioneers of Web-based sales, customer service and marketing solutions with its first generation of products, released in 1996. Today, more than two-thirds of [Onyx Software's](#) customers are using its Web products.

Onyx Adds to Core Sales Functionality

Also announced today were several additional sales-related enhancements to Onyx Front Office including Onyx Connect, which provides two-way Outlook integration and Onyx Pricing Manager, which will allow sales people to easily provide accurate quotes at the point of sale. On April 20 Onyx announced global partnership, with [Miller Heiman, Inc.](#) and Norstan Consulting, offering Strategic Selling for Onyx Front Office, based on [Miller Heiman's](#) trademarked Strategic Selling(R) sales processes.

About [Onyx Software Corporation](#)

[Onyx Software](#) is a leading provider of practical, Web-enabled enterprise relationship management (ERM) software solutions. ERM software automates the key functions that enable enterprises to more effectively acquire, manage and retain customers, partners and relationships. The Onyx solution is rapidly deployable, scalable, flexible and reliable, resulting in low total cost of ownership and rapid return on investment. The Onyx Front Office product family allows enterprises to automate the customer lifecycle across the entire enterprise, from marketing to sales to customer service, instead of only individual departments. The company targets mid- to large-sized organizations and divisions of Fortune 500 companies. Onyx is headquartered in Bellevue, Washington, with sales offices in the United States, United Kingdom, France, Singapore and Australia and distributors in Latin America, Asia and Europe. Onyx products have been licensed to over 350 customers in a variety of industries, including financial services, high technology, health care, manufacturing and telecommunications. Customers include [American Express Financial Advisors](#), Brooklyn Union Gas Company, [Cincinnati Bell Telephone](#), [Datastream Systems Inc.](#), FirstWorld Communications, GIGA Information Group, NTL Internet, [Piper Jaffray](#), and [Sierra Health Services, Inc.](#)

To learn more about [Onyx Software Corporation](#), call (888) ASK ONYX, email info@onyx.com or visit the Onyx Web site at www.onyx.com.

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Article View[« Back to Results](#)[< Previous](#) Article 18 of 27 [Next >](#)[Publisher Information](#)[Print](#)[Email](#)☐ Mark Article[Abstract](#), [Full Text](#)**Third Generation Extranet Commerce Software Unveiled by SpaceWorks, Inc.**

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ROCKVILLE, Md., Jan. 19 /PRNewswire/ – **SpaceWorks, Inc.**, an emerging leader in **Extranet Commerce** software, today announced Version 3.0 of its OrderManager(R) application, an award-winning electronic commerce solution which automates the supply chain transactions of FORTUNE 1000 companies and their trading partners over the Web. This third generation of the OrderManager application – which represents an investment of five years and several million dollars in Research & Development, and which has been proven effective in major corporate installations – adds expanded capabilities to strengthen real-time, Internet/**Extranet**-based "self-service" order processing channels created between a company's back-end enterprise resource planning (ERP) systems and its trading partners.

Instant Links To UPS & FedEx Web-Based Tracking Systems – From within the OrderManager application, trading partners requiring the shipping status of electronically-submitted orders can now click a hypertext link to immediately view information on the transit progress of their purchases from either the UPS or FedEx Web sites. This feature enhances the Version 2.0 "Order Status" functionality which allows trading partners to look up previously-placed orders by any number of options (e.g., P.O. number, confirmation number, date, etc.), and automatically view comprehensive information about each order.

Guest Feature – OrderManager 3.0 now allows clients to provide temporary E-Commerce access to prospective trading partners – allowing them to sample the features and functionality of the software without placing orders. With billion-dollar companies experiencing order management cost-savings of up to 70% and trading partners experiencing greater productivity and increased satisfaction with this application, encouraging examination of an OrderManager-based E-Commerce system clearly demonstrates the benefits of "self-service" Web transactions.

Full Text (821 words)

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Industry: COMPUTER/ELECTRONICS

OrderManager(R) Ver. 3.0 Offers Advanced Capabilities and Foundation for

"Virtual Warehouses" Along the Supply Chain

ROCKVILLE, Md., Jan. 19 /PRNewswire/ -- **SpaceWorks**, Inc., an emerging leader in **Extranet** Commerce software, today announced Version 3.0 of its OrderManager(R) application, an award-winning electronic commerce solution which automates the supply chain transactions of FORTUNE 1000 companies and their trading partners over the Web. This third generation of the OrderManager application -- which represents an investment of five years and several million dollars in Research & Development, and which has been proven effective in major corporate installations -- adds expanded capabilities to strengthen real-time, Internet/**Extranet**-based "self-service" order processing channels created between a company's back-end enterprise resource planning (ERP) systems and its trading partners.

The latest version of OrderManager offers some key enhancements:

Order Approval Functionality -- Version 3.0 adds purchase authorization procedures to the prior version, enabling purchasing representatives to research desired products and build an order form containing selections which can then be electronically routed to a supervisor for review and approval. The management executive can then quickly view the pending order, and by simply clicking "yes" will immediately submit the order electronically or by clicking "no (with comment)" -- create an audit trail that prevents unauthorized purchases.

Instant Links To UPS & FedEx Web-Based Tracking Systems -- From within the OrderManager application, trading partners requiring the shipping status of electronically-submitted orders can now click a hypertext link to immediately view information on the transit progress of their purchases from either the UPS or FedEx Web sites. This feature enhances the Version 2.0 "Order Status" functionality which allows trading partners to look up previously-placed orders by any number of options (e.g., P.O. number, confirmation number, date, etc.), and automatically view comprehensive information about each order.

Enhanced Search Engine -- In addition to sporting a re-design of the prior version's search engine user interface, Version 3.0 for the first time supports multi-parametric searching, enabling a trading partner to simultaneously search for several classes or types of products at once, according to the individual characteristics of each class. Then, the matching results are displayed in one merged result set -- speeding up the entire research phase of the ordering process compared to Version 2.0.

Guest Feature -- OrderManager 3.0 now allows clients to provide temporary E-Commerce access to prospective trading partners -- allowing them to sample the features and functionality of the software without placing orders. With billion-dollar companies experiencing order management cost-savings of up to 70% and trading partners experiencing greater productivity and increased satisfaction with this application, encouraging examination of an OrderManager-based E-Commerce system clearly demonstrates the benefits of "self-service" Web transactions.

Cross-Sell Functionality -- Version 3.0 now enables a seller to easily link related or complementary products to each other, making it easy to generate add-on revenues. When a buyer views a desired product spec sheet, a list of associated products will display, delivering an automatic way to view other potential items of interest and to conveniently add them to the order form.

"OrderManager 3.0 provides a fundamental building block in the creation of a multi-tier 'virtual warehouse' which can be deployed throughout the supply chain," said Dave MacSwain, President and CEO of **SpaceWorks**. According to MacSwain, a 'virtual warehouse' emerges when a distributor deploys OrderManager for use by its resellers, who then make their own OrderManager version available for use by their corporate customers -- delivering a seamless, transparent way for these end-users to access inventory throughout the chain. "The 'virtual warehouse' benefits buyers by enabling them to purchase products online, at any time, from anywhere," adds MacSwain.

"**SpaceWorks** has consistently shown an ability to deliver effective, enterprise-class applications for business-to-business Internet commerce," said David Alschuler, an analyst at the ①Aberdeen Group of Boston, MA. "We expect this market segment to substantially pick up the pace of its on-line efforts in 1998, particularly where it can

streamline business processes among its existing partners."

"We continue to be impressed by the strides made by **SpaceWorks** and recognize its positive reputation in the marketplace," said Gina Cassinelli, Worldwide Marketing Manager for  **Hewlett-Packard Company's** Internet Applications and Systems Division. "**SpaceWorks'** five years of experience in this evolving marketplace establishes it as a stable and knowledgeable applications developer demonstrating a clear understanding of the needs of business-to-business Internet Commerce."

OrderManager was initially developed on the HP-UX platform, yet also operates on Sun Solaris and Microsoft NT platforms. Version 3.0 will be available by the end of Q1 '98.

Headquartered in Maryland's "Technology Corridor," **SpaceWorks** develops, markets and supports a suite of business-oriented electronic commerce software applications for use on the Internet, through private corporate intranets and over extranets. The OrderManager software enables corporations to reinvent the way they operate with their supply chain partners, suppliers, and business clients in the information economy. More information is available on the Company's Web site, <http://www.spaceworks.com>.

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A pattern to support user-defined categories of domain objects

L Gauthier, R Guay, P Rodriguez-Paz. [Journal of Object - Oriented Programming](#). New York: [Jul/Aug 1999](#). Vol. 12, Iss. 4; pg. 26, 4 pgs

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Abstract (Article Summary)

In object oriented software design, whenever the shape of a class changes, the problem of object migration must be dealt with. In addition, there is often a need to add new classes to deployed systems. The addition of a class usually implies some form of recompilation of the executable program or of a runtime module. A pattern is presented that can alleviate these problems by providing the possibility for user-defined (or runtime) object types.

Full Text (2897 words)

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[Headnote] ABSTRACT

[Headnote]

In virtually all applications, there is a need to identify and define a set of domain objects. A strength of OO systems is that these domain objects can usually be mapped directly to software structures (objects) that "acquire" or inherit their structure and behavior from classes defined by the application designers. However, one of the problems faced by software designers and ultimately by users of applications is the disruption caused by changes to the definitions of classes and the need to deal with the side effects of such changes. Whenever the shape (i.e., the set of instance variables) of a class changes, we must deal with the problem of object migration (existing objects have to "evolve" to accommodate the new object structure). This is especially true in applications that handle persistent objects (most applications do) and in distributed systems in which objects are moved from one user or application to another. In addition, there is often a need to add new classes (or domain object categories) to deployed systems. This situation also constitutes a maintenance stumbling block because the addition of a class usually implies some form of recompilation of the executable program or of a runtime module. In this article, we present a pattern that can alleviate these problems by providing the possibility for user-defined (or runtime) object types.

PATTERN MOTIVATION

The motivation for the pattern can be summarized as follows: In many applications, object categories (or types) as well as object attributes are not all known in advance and can vary from one organization to another. It is often the case that we want to give users the possibility to define or enhance the set of attributes or traits associated with a given category of objects.

For example, it is difficult to define a "universal" format for the contents of a soil analysis. Furthermore, a given format may prove to be inadequate as needs change due to legislation, industrial practices, or other factors. However, we still want uniformity in our representation of soil analysis reports, i.e., we want all soil analysis to have the same set of attributes.

Thus, we are urged to provide a viable alternative to subclassing or class modifications to extend the semantics of objects. If we can forego (at least in some situations) the need for new class definitions (or class modifications), we avoid the problems associated with changes to existing class definitions and avoid the creation of a large number of subclasses often supporting very little behavior or structure.

In fact, changing the definition of a category or class is a "heavy" process. It implies a recompilation of the class and its methods, and a migration of instances of the class. For deployed systems, it usually means the replacement of one or more runtime modules.

For persistent objects that are instances of the changed class, it implies the migration of the object, and in the case of an object-oriented database management system (OODBMS), it implies updating the schema of the database. A more "lightweight" mechanism would often be useful, adequate, and less of a maintenance nightmare for software developers and end users.

Moreover, in a given organization's information management system, we may want to allow for the definition, by the end user, of new types of operations, equipment, or products. We believe that in many situations, we do not need a new class definition to do this. We may also want to give end users the possibility to add attributes or properties to existing object categories without any change to the class definition. But what happens with existing instances of that type? Here we present a simple and elegant solution to this problem that has been implemented and used in an agricultural and environmental information management system employing a persistent object store.

IMPLEMENTATION

Our approach to the problem just described is to define object categories or classes that will be used to instantiate abstract objects or entities referring to a set of prototypical attributes. These named properties or traits* serve to define more or less complex objects. In fact, the role of these objects is somewhat similar to the prototype objects in the "Prototype" pattern.² In this pattern, a prototype object serves as the model that is cloned to produce new objects. In our pattern, when a concrete object or entity is needed, the entity type on which it is based must be specified.[†] The new instance "gets" a set of traits from its entity type. In the proposed scheme, when the "traits" of the prototypical object are modified or when new traits are defined, these modifications are eventually propagated to the concrete entities.

To implement the pattern, we defined class hierarchies containing classes respectively named `AbfEntityType` and `AbfDomainEntity` (see Fig. 1). An `AbfEntityType` has an instance variable called `traitManager`, which contains an `AbfTraitManager` referring to instances of `UIParameterHolder`. The latter are used to hold the name, description, and properties of a parameter (a parameter can be a numeral, alphanumerical, date, time, boolean, etc.). An `AbfDomainEntity` also has an instance variable called `traitManager` containing a collection of associations between the object representing the trait and associated with the entity type (a `ULParameterHolder`), and a primitive object such as a number, string, or boolean. In our implementation, if the definition of a trait is changed at the level of the entity type, this modification will be reflected in the concrete entity the next time the corresponding trait is accessed. If the trait is removed from the type, the orphan trait can eventually be removed from the domain entity.

A case study

In Figure 2, the same objects are represented, this time with sample values for the instance variables. The classes `AbfEquipmentType` and `AbfEquipment` are subclasses of `AbfEntityType` and `AbfDomainEntity`, respectively. Now the

problem is this: How do we account for the various representation needs of equipment types such as tractors, lawn mowers, scales, computers, etc. without going through the burden of creating a new class for each new type of equipment?

We solve this problem by creating instances of `AbfEquipmentType` and by defining traits for instances of `AbfEquipment` that will refer to this equipment type. For example, the identifier variable of one `AbfEquipmentType` instance contains the string `Tractor`. This `AbfEquipmentType` instance has traits named `power` and `drive`. The `power` trait is an instance of the class `ULNumericParameter` and has a default value of 0.0, units of 'kW', and a minimum value of 0. The `drive` trait is an instance of `ULAlphanumericParameter` and is restricted to a set of predetermined values such as #('Rear wheel drive' 'Front wheel assist' 'Four wheel drive'). These traits would probably be meaningless or inappropriate if they were applied to other types of equipment such as a computer, scale, or plow.

In the proposed scheme, to define an instance of `AbfEquipment`, we must specify the type of equipment to which it belongs (e.g., the instance of `AbfEquipmentType` whose identifier is `Tractor`). Whenever we want to get the set of traits associated with a tractor, it is obtained from the entity type (the instance of `AbfEquipmentType`).

In fact, there is an `AbfEntityType` method called `newConcrete` to create instances of `AbfDomainEntity`. In our current Smalltalk implementation, the `AbfEquipment` instance creates, at the time of initialization, a Dictionary associating trait names and the default value of the trait (e.g., 0 or 'Rear wheel drive'). Whenever the trait of an instance of `Equipment` is required or assessed, it is "wrapped" with the information stored in the `ParameterHolder` instance that is used as the key in the dictionary.

In fact, a copy of the `ParameterHolder` is made and assigned the value of the key-value pair for which it is the key. This way, the user is presented with a "fully dressed" parameter with a default value, description, range, etc.

When a trait is retrieved from a concrete entity, it is only the value of the parameter that can be changed (i.e., the value part in the association linking the trait name to a value).

Instances of `AbfDomainEntity` always obtain the list of traits from their "entity type." This way, we are certain that whenever a trait is added to the entity type, this addition will be reflected in the concrete entity the next time its traits will be accessed.

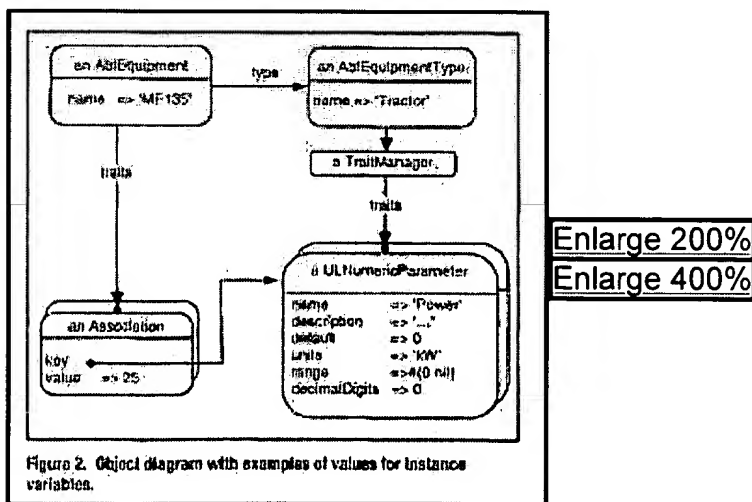
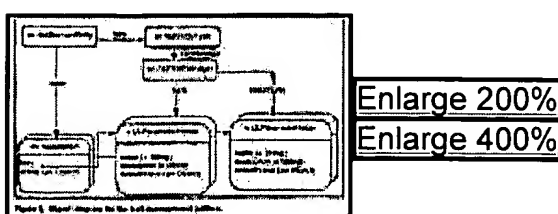


Figure 2.



Figure

In the proposed scheme, a change to the trait definition (default value, range, choices, etc.) becomes effective in all objects of the concerned "type" and is reflected to the user each time a parameter is visualized or assessed. However, the implications of any such change should be carefully considered because consistency can be compromised, and information can be lost if the definition of a parameter changes drastically (for example, from an alphanumeric parameter to a numeric one). Moreover, the removal of a trait from the entity type can produce "orphan" traits in the concrete objects. A mechanism to eliminate "orphan" traits may be important in some applications.

It is also possible to have a number of predefined or "standard" traits that are "precompiled" in the definition of the subclass of `AbfEntityType` and thus automatically and "permanently" (unless a private method is changed) associated with instances of that class. For example, we could decide or postulate that all types of pesticides (whether they are herbicides, fungicides, insecticides, etc.) have a "hazard level" trait and thus define this trait in the private instances initialization method of `SgPesticideType`. For an `AbfDomainEntity`, this "static" trait will appear exactly as the user-defined ones. To implement this, we defined the `AbfTraitManager` class whose instances contain references to two collections: the collection of static or system-defined traits and the collection of runtime or user-defined traits. The protocol used to access traits for an entity type returns the union of these two collections. The main advantage of using predefined traits is linked to the fact that, to an application, they appear and behave almost exactly like the user-defined traits.

As noted before, an end user or at least a system administrator can define new instances of `AbfEntityType` or modify the set of traits for existing instances as the need arises. New object types and traits become available immediately to represent the existence and properties of concrete objects. If a concrete entity is asked to return the value of a trait that was not previously assigned, it returns the default value specified in the entity type.

The need for object persistence

In the above scheme, it is possible to define, in a deployed system, new entity types (e.g., Seeder, Combine Harvester, Plow, Truck, etc.) as instances of `AbfEquipmentType` and the traits that are specific to each type. However, we also need a mechanism to make these definitions persistent. This can be done using a variety of mechanisms (object filing, text files, or a database). The simplest (conceptually and operationally) way to do this is through an object-oriented database management system (OODBMS). With an OODBMS, entity types are retrieved as needed from the database and used as a template for the concrete entity traits. If objects are shared through a multi-user database, there is an additional advantage to the proposed scheme because entity types are defined in the common object store and thus immediately reflected in all client applications without any change to the runtime module of the client application. Without an OODBMS, all entity types could be retrieved (loaded from a disk file) at the start of a session and saved to disk whenever changes occur.

Smalltalk Implementation

The proposed pattern was implemented in various flavors of Smalltalk. As mentioned earlier, the pattern relies on the existence of a library of classes that support the creation and description of "rich parameters" for primitive objects such as numbers, strings, dates, times, booleans, etc. These classes are not formally presented here because they are not central to the pattern and could be implemented in a number of ways from the very simple to the more general or sophisticated.

`AbfEntityType` and `AbfDomainEntity` are two abstract classes used to represent, respectively, the types of entities present in an application and the "real-world" entities. The class `AbfDomainEntity` is the ancestor class for all domain or so-called "real-world" objects. It implements basic behavior and structure such as the naming, printing, and modification of domain objects.

`AbfEntityType` implements the behavior required to add, remove, rename, and retrieve traits for a category of entities as well as the behavior required to create instances of subclasses of `AbfDomainEntity`. It also implements basic printing and accessing behavior. The `traitManager` variable of an `AbfEntityType` contains an instance (of `AbfTraitManager`) that refers to two collections (instances of `Set`) of instances of `ULParameterHolder`. An `AbfDomainEntity` has an instance variable called `type` that refers to an instance of `AbfEntityType`. It also has a variable called `traits` that refers to a collection of pairs or associations between the `ULParameterHolder` instance of its type and a primitive object representing the value of the trait.

When the message traits is sent to an AbfDomainEntity, a set containing copies of ULParameterHolder instances is created first.

A value is then assigned to each of these elements based on the values held by the instance for trait. The resulting set or collection is then returned. However, before returning the set of traits for a concrete entity, we must make sure that any changes to the value of a trait will be recorded. One way to do this is to use event handlers so that whenever the value of a parameter is changed, the concrete entity receives a notification.

This mechanism is implemented in the AbfDomainEntity>>traits method.

USES

We use the proposed pattern in a number of situations where there exists a variety of object categories differing only in the nature of attributes characterizing instances of these categories. For example, for analysis results (soil, water, milk, etc.) we will want to record, among other things, the date and origin (field, lake, cow, etc.) of the sample. These attributes should probably be stored in instance variables. However, each type of analysis result is characterized by a set of variables (pH, dry matter, fat, calcium, potassium, etc.) that differs from type to type, and new variables may need to be defined after initial deployment. We could define a different class for each analysis category, but that is not without problems of rigidity and increased software engineering and maintenance efforts as mentioned earlier. When used judiciously, the pattern can alleviate these problems and provide for considerable flexibility in the software system that makes use of it. In fact, it is possible to build a generic end-user interface to define entity types and manage traits in a deployed system.

Another advantage of the pattern is that during the development of an information management application, it allows for the implementation of a quick and simple solution that can later be implemented differently if the need arises. In fact, the pattern provides for the addition of user-definable attributes to semantically rich business objects (objects that have a class-specific behavior and structure). In a way, it supports constructs that have the conceptual simplicity of the relational model by using the expressiveness of the object-oriented model.

In fact, the pattern extends the reach of the business object and provides the user with a general solution to the problem of extensioning the more or less static class definitions. It also allows for the evolution of the database schema without requiring any changes to the shape of existing classes.

CONCLUSION

The proposed pattern foregoes the possibility to have get and set methods for any particular attribute (unless we make use of instance-specific methods, but that is another story). Thus, accessing or modifying a specific trait cannot have any trait-specific side effect. It also introduces a potential pitfall because one could write code that relies on the existence of named traits that are not part of the class definition. To handle such cases, exception-handling code and mechanisms must be used, because a program cannot assume that a given user-created trait is present.

For these reasons, the proposed scheme is certainly not a universal replacement for bona fide definitions of domain categories (classes). It is, however, quite universally applicable when a persistent object store is present and whenever we want to provide end users or managers of deployed systems with the possibility to define or modify a set of named primitive objects (strings, magnitudes, etc.) for various categories of business objects. We are confident that by combining the definition of business object categories with the judicious use of the pattern described herein, one can improve the flexibility and expandability of many applications.

[Footnote]

* In this article, we use the term "trait" to refer to the runtime properties or attributes of an object. This is to avoid confusion with more widely used terms such as property or attribute.

[Footnote]

To avoid any confusion in terms, we will use the expressions entity type and concrete entity to refer to the instances describing prototype objects and concrete objects, respectively.

[Reference]

References

[Reference]

1. Meyer, B. "Schema Evolution: Concepts, Terminology, and Solutions," Computer, 29(10):11 121, 1996.
2. Gamma E. et al. Design Patterns: Elements of Reusable Object-Oriented Software, Addison-Wesley, Reading, MA, 1995.

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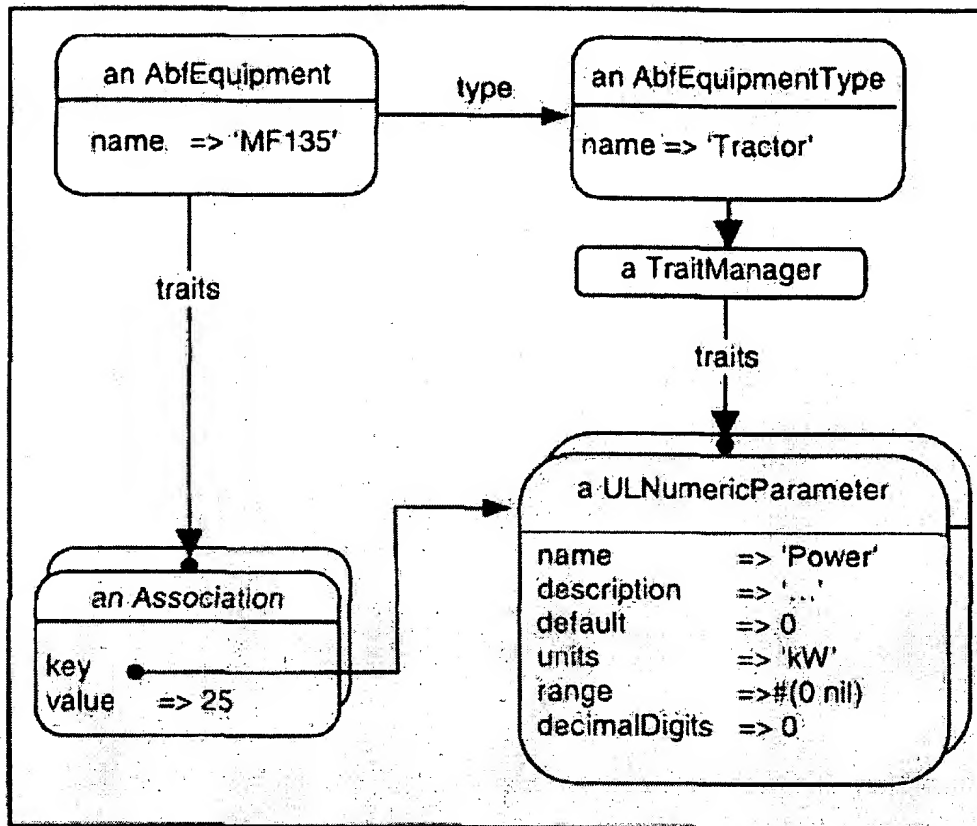


Figure 2. Object diagram with examples of values for instance variables.

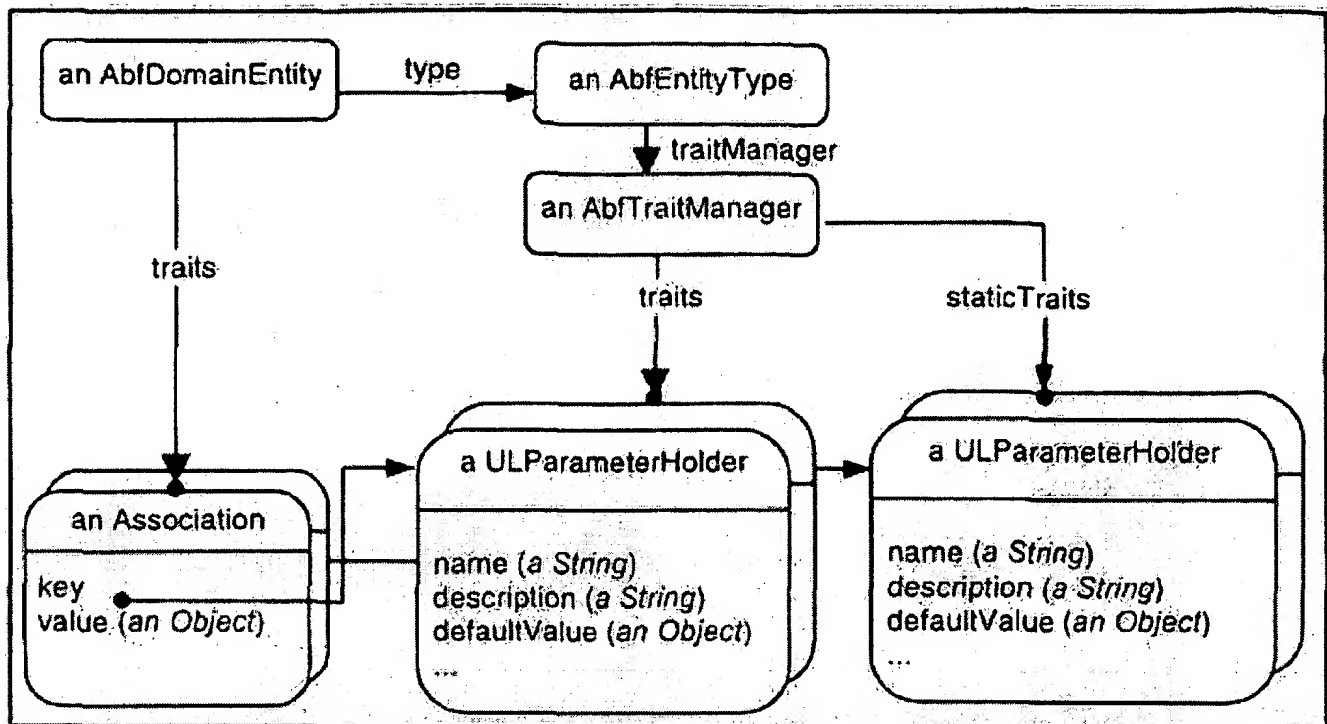


Figure 1. Object diagram for the trait management pattern.